Federal Democratic Republic of Ethiopia

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ET 1190 (2005) (English): Leather – Determination of flexing endurance

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ETHIOPIAN STANDARD

ES 1190:2005

Second edition
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Leather – Determination of flexing endurance

ICS: 59.140.40

Descriptors: leather, determination, flexing endurance, definitions, principle apparatus, test piece, procedure and test report.

Price based on 5 pages.

Reference number
ES 1190: 2005

Foreword

This Ethiopian standard has been prepared under the direction Textile and Leather Technology Standards Committee.

In the preparation of this standard reference was made to the following document.

Tanzania standard, TZS 206: 194:1984, Leather-Determination of flexing endurance

This second edition ES 1190 cancels and replaces the first edition Leather – Determination of flexing endurance (ES D.N8.207: 1990), which has been technically revised.

Acknowledgement is made for the use of the information from the above publication.

Leather – Determination of flexing endurance

1 Scope

1.1 This Ethiopian standard pecifies the methods for the determination of flexing endurance of light leather and their surface finishes.

2 Normative references

The following standards contain provisions, which, through reference in this text, constitute provisions of the Ethiopian standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreement based on the Ethiopian standards are encouraged to investigate the possibility of applying the most recent editions of the Ethiopian standard indicated below. Registers of currently valid standards are maintained in the Quality and Standards Authority of Ethiopia.

ES 1180: 2005, Leather -Terminology
ES ISO 2418: 2005, Leather – Chemical, physical and mechanical fastness test - sampling
ES ISO 2419:2005, Leather – Physical and mechanical test – Sample preparation and conditioning.
ES ISO 4044*:2005 Leather - Preparation of chemical test samples

3 Definition

For the purpose of this standard the definitions in ES 1180 shall apply

4 Principle

The test piece is folded and clamped at each end to maintain it in a folded position in a machine designed to flex it. One clamp is fixed and the other moves back - wards and forewords causing the fold in the test piece to run along it. The test piece is examined periodically to assess what damage has been produced.

5 Sampling

Sampling of leather shall be carried out in according with the method of test specified in ES ISO 2418, ES ISO 2419, ES ISO 2588 and ES ISO 4044*.

6 Apparatus

The following apparatus shall be used;

The general view of the apparatus is as shown in figure 1,2 and 3 here in:

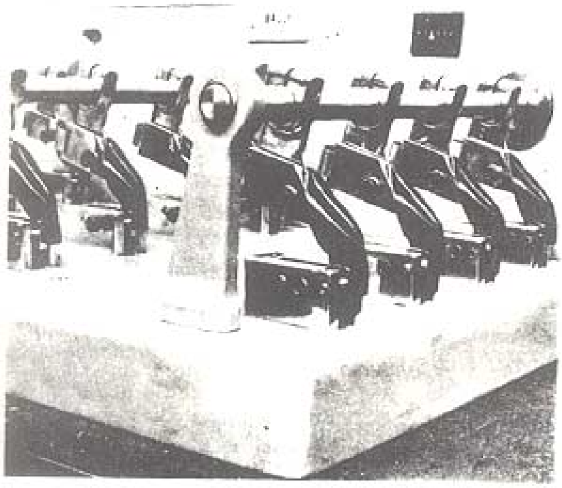
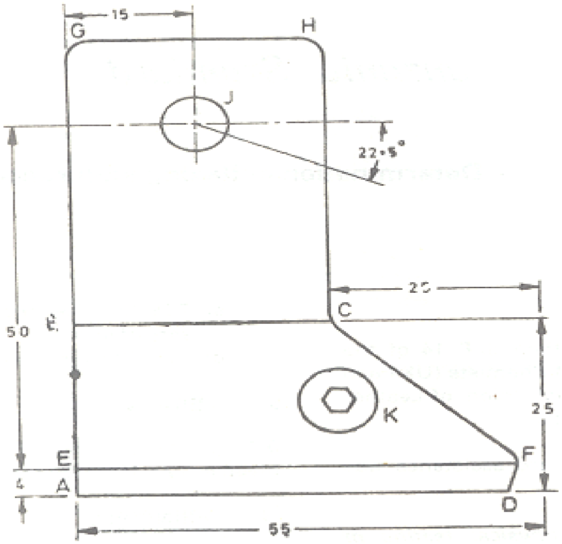


FIGURE 1 — Apparatus for the measurement of flexing endurance of light leathers and their surface finishes.

Upper clamp - The upper clamp shall consist of a pair if flat plates. One plate shall have a shape of a trapezium ABCD (See fig. 2) with the sharp corner at D rounded to a radius of 2mm.

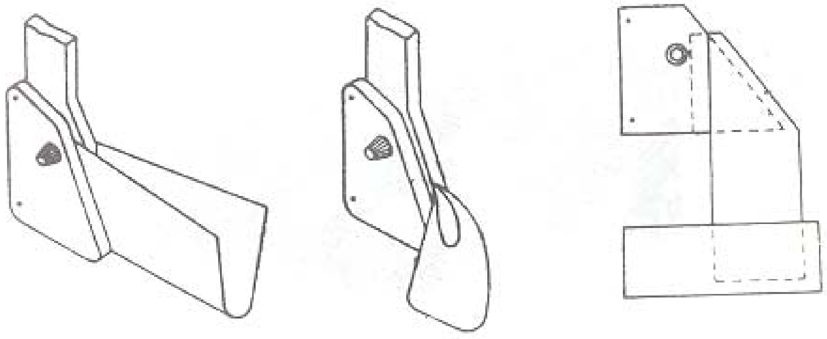


All dimensions in millimetres

FIGURE 2 — Upper clamp for holding the test piece.

It shall have a ledge EF on which the folded test piece rests. The other plate shall have the shape EGHCF. It is possible to screw the two plates together, so as to hold one end of the test piece between them as shown in Figure 3 A. herein). The screw **K** which draws the plates together acts also as a stop, which prevents the end of the test piece from being thrust too far towards the back of the clamp. Between the plates near the edge AB is a stop, which prevents them from coming together near AB, and so ensures that they clamp the leather firmly near F. A motor about a horizontal axle J shall reciprocate the upper clamp as in (Fig. 2) here in. In the position shown in (Fig.2) the ledge EF is horizontal, and the end F is at its highest point. The clamp descends through an angle of 22½^{0} and returns 100 ± 5 times per minute. A counter records the number of cycles.

6.1.2 Lower clamp- the lower clamp is fixed and lies in the same vertical plane as the upper clamp. It consists of a pair of plates, which are possible to be screwed together to hold the other end of the test piece between them. If the upper clamp has been turned to the position where the edges. EF is horizontal (See Fig.2) the upper edges of the plates of the lower clamp are 25 mm below the ledge EF.(Fig. 2) here in.



3A Test Piece in Upper Clamp

3B Test piece Folded Back

3C Test Piece Clamped in Upper and Lower Clamps

FIGURE 3 — Insertion of test piece in clamps.

7 Test piece

Cut out test pieces rectangular in shape 70mm x 45 mm from leather samples from the sampling location for physical testing of leather in accordance with ES ISO 2418. The test pieces shall be conditioned according to the method specified in ES ISO 2819

8 Procedure:-

8.1 Insertion of test piece in clamps: -

Turn the motor until the ledge EF is horizontal. Fold the test piece so that the two longer sides are brought together, turning in wards that surface of the leather, which is to be observed during the test. (Unless otherwise specified, fold the leather grain inwards). Clamp the folded test piece in the upper clamp as shown in Fig. 3A with one end of the test pie against the stop and the folded edge against the ledge. Draw the free corners of the test piece outwards and downwards as shown in figure 3B. so that the surface which is turned inwards in the clamp is turned outwards below it. Draw the test piece down, bringing together its two corners which have not been clamped, clamp it in the lower clamp as shown in Fig. 3C with the part of the fold between the clamps vertical, and using no more force than is needed to make the leather just taut.

NOTE: -The force needed to pull the leather taut when first clamping the test pieces in the machine depends upon the thickness and stiffness of the leather. The force applied should not exceed what is needed to pull the leather taut.

8.2 Flexing

Clamp the test piece in the machine in the manner described in clause 6.1.1 and clause 6.1.2 and switched on the motor. After 100,1000 and 10,000 cycles switch off the motor and examinethe leather finish to see whether it has been has been damaged.

Record any damage observed its nature and the number of cycles at which it was observed. After 2,4,6,8,12,16 and 32 hours of flexing, examine the leather itself to see whether it has been damaged.

Record any damage observed, its nature and the number of cycles at which it was observed.

8.2.1 To find whether it has been damaged, remove the test piece from the clamps for examination, if necessary, and subsequently return it for further flexing. When it is replaced, it should be clamped as nearly as possible in the same position as before use the clamps marks as a useful guide for replacing the test piece correctly. If the test pieces extend during flexing do not pull them taut while removing and replacing.

8.2.2 If the machine is stopped for any considerable time (for example, overnight) while test pieces air clamped on it, the clamp should be rotated to a position such that the test pieces are not fully extended.

8.2.3 For examining the finish of leather damage, illuminate surface and use a magnifying glass giving about six-fold magnification, if necessary.

9 Expression of results

9.1 Give description as to the damage of the finish in respect of:

a. Change of shade (graying) of the finish film without other damage;
b. Crazing of the finish with smaller or greater surfaces cracks;
c. Loss of adhesion of finish to the leather with slight or considerable changes of color in the folded area;
d. loss of adhesion of one finish layer to an other with slight or considerable changes of color; and ;
e. Powdering or flaking off of finish, with slight or considerable changes of colour.

9.2 Give description as to the damage of the leather in respect of:

a. Development of coarse grain folds (called 'pipey' grain);
b. Loss of an embossed grain pattern,
c. Cracking of the grain layer,
d. Powdering of the fibers (usually on the flesh sides or in the corium rather than in the grain layer); If much powdering has occurred, the leather may develop an empty feel, even if there is little sign of powder on its surface; and
e. Continuation of the breakdown of fibers to such an extent that a hole develop through the entire thickness of leather.

10 Test Report

The test report shall include the following particulars:

a. Reference to this standard;
b. Complete identification of the sample;
c. The results of the tests;
d. Any unusual features noted during the determination.; and
e. Any operation not include in the stand any operation regarded as optional

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Quality and Standards Authority of Ethiopia

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It has undergone several restructuring programs since its establishment, and currently provides a comprehensive range of services in the following areas:

- Ethiopian Standards development;
- Regulation enforcement (Compulsory product certification and legal metrology);
- Laboratory testing in the fields of mechanical, electrical, chemical and biological testing;
- Calibration of instruments in various measurement areas;
- Product inspection;
- Training on standardization, quality, testing and metrology; and
- Provision of up-to-date standards information.

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Orders for all Ethiopian Standards, and international and foreign national standards, including electronic versions, should be addressed to the Documentation and Technical Information Group at the Head Office. A Catalogue of Ethiopian Standards is also available at our Head Office, Branches and Representative Offices.

INTERNATIONAL INVOLVEMENT

QSAE, representing Ethiopia, is a member of the International Organization for Standardization (ISO), International Organization of Legal Metrology (OIML) and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the International Electro-technical Commission (IEC). It is a founding member of the African Regional Organization for Standardization (ARSO).

MORE INFORMATION?

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The Head Office of QSAE is at Addis Ababa with seven Branches and three Representative Offices elsewhere in the country and at Djibouti ready to cater for all your quality and standards needs.

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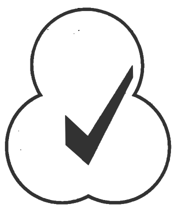

Quality Mark